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Open Preperitonial Ventral Hernia Repair in Babylon, Our Experience

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Abstract:

Backward and Objective: The surgical technique depend on 2 physical laws may rule the ventral hernia physics and its repair. The first is Lapla's Law, which describe the co- relation of intra-abdominal pressure (P) to the radius(r), tension (T) and thickness of ventral wall (M). This can be given away in following equation:

P=TxM/r. this equation describe as the bigger the abdominal l wall radius and the thinner the wall the more tension to wall to induce of ventral hernia. The other law is Pascal's Law; which statuses that any pressure increase on an enclosed fluid is transmitted undiminished through the fluid and acts equally in all directions.

The aim Of this study was to show our experience in repair of ventral hernia by sublay polypropylene light weight mesh taking into account recurrence, complications, discomfort, cosmetic result, and patient satisfaction

Patients and Methods: This is prospective descriptive quantitative study for the period from May 2014 to December 2016, at Al-Hilla teaching hospital, Al Immam Ali general hospital and Al-Hyate hospital. 67 patients with different type of ventral hernia had undergone open ventral hernia repair, the surgical technique; all patient received pre-operative intravenous broad spectrum antibiotics, and all patients with BMI more than 30 receive prophylactic anticoagulant. The mesh is a polypropylene mesh of light weight type less than 80gm/m2 (OptileneTM - Braun).

Results : we have 67 patients were involved in our study all those patients with ventral hernia were manage as open Preperitonial "sublay" Th e mean age was 38.5 years. The surgical site infection tow cases one female and other male .the seroma formation in 5 cases all are female. Ather recommended complication in other study as intestinal obstruction, recurrent, Enter cutaneous fistula, flap necrosis all are 0 in our study.there is no related completion.

Conclusions: In our study we found no recurrence no major complication as intestinal obstruction or fistulaization, but few patient with seroma and Surgical site infection. So we conclude that sublay mesh is one of best way of ventral hernia repair with minimum complications.

Key words: hernia, Lapla's and infection Introduction:

Both hernia and recurrence of hernia are one of common problem in surgical practice. The primary open repair of Ventral Hernia is suturing of the aponeurosis on each side directly. This repair is associated with high recurrence rate (>50%), so this lead to introduction of using prosthetic mesh material to

strengthen the repair. Luijendijk et al show significant reduction in recurrence rate after using prosthetic mesh (from 50% to 24%). Three sites used to implant the mesh in the abdominal wall; the first one is onlay- mesh, in this procedure the mesh sutured to the anterior rectus sheath. This is easy to be done, but associated with high recurrence rate and local wound complications. The second is Inlay-mesh, this procedure means suturing the mesh to the inner edge of hernia defect, and this associated with extremely high recurrence rate. The third is sublay (extraperitoneal underlay) ,this means the mesh implanted at sub muscular ,extra peritoneal space as described by Stoppa, which need little subcutaneous soft tissue dissection, It is associated with low complications and recurrence rate. The intraperitoneal underlaymesh use the same principle but to be used by laparoscopic procedure. (1) (2)

Two physical laws may govern the hernia physics and its repair. The first is Lapla's Law, which describe the relation of intra- abdominal pressure (P) to the radius(r), tension(T) and thickness of wall(M). This can be shown in following algebraic equation: P=TxM/r. this equation mean the bigger the abdominal radius and the thinner the wall the more tension to wall to induce hernia. The other law is Pascal's Law; which states that any pressure exerted on an enclosed fluid is transmitted undiminished throughout the fluid and acts equally in all directions. So when we use sublay mesh the pressure will push it to the wall and fix it in its place, while on other hand the use of onlay mesh technique the pressure will push it away from the wall resulting in displacement and recurrence.(3) We have to choose between different type of available mesh. The polypropelene mesh with light weight type is associated with minimal contracture and less postoperative pain. (4). The effect of implanted polypropylene mesh are generation of inflammatory response, that result to formation of dense fibrous tissue, this fibrous tissue with thick mesh(>80gm/m2) will cause stiffness ,and shrinkage of mesh, while the use of light weight mesh (<80gm/m2) cause less fibrosis so better compliance and less shrinkage, hence better tissue incorporation.(5) The transfascial suture fixation of mesh is associated with more pain within first six postoperative weeks (6). The Sublay placement of mesh was associated with the lowest risk for recurrence and was the best of other treatment modalities. Sublay was also associated with the lowest risk for surgical site infection due to its good vascularity surrounding and deeper to subcutaneous tissue. (7) Because of the possibility of mesh infection, simultaneous, contaminated, or even clean-contaminated intraperitoneal procedures should be avoided if possible.(8) Patients undergoing laparoscopic or open ventral hernia repair with large defect widths and total area have a greater chance of pain and activity limitation at one month follow-up, but not long term. Large defect are associated with increased early and chronic discomfort in open ventral hernia repair only.(9)

The aim of this study was to show our experience in open repair of ventral hernia by sublay polypropylene, light weight mesh taking into account recurrence, complications, discomfort, and patient satisfaction.

Patient and methods:

This is prospective descriptive quantitative study for the period from May 2014 to December 2016, at Al-Hilla teaching hospital, Al Immam Ali general hospital and Al-Hyate hospital. 67 patients with different type of ventral hernia had undergone open ventral hernia repair. All patients were operated upon by two surgeons. Those ventral hernias include umbilical, epigastric and incisional hernias (different sites of incisions as midline, paramedian and pfannestiel's incisions).

All patients on admission to hospital their personal data are recorded and underwent the routine preoperative investigations. The supposed risk factors like obesity, diabetes, previous history of wound

infection, type of incision made all were recoded. All post- operative complications, like infection whether deep or superficial, seroma, patient comforts and recurrence are recorded.

The surgical technique; all patient received pre-operative intravenous broad spectrum antibiotics, and all patients with BMI more than 30 receive prophylactic anticoagulant. The mesh is a polypropylene mesh of light weight type less than 80gm/m2 (OptileneTM -Braun).

After skin and subcutaneous incision are done, the hernia sac demarcated and dissected opened, any adhesions of the sac and abdominal viscera released. Then a plane opened between the posterior rectus sheath and the rectus muscle, this space should be so roomy to accommodate the mesh in this plane, which is usually tailored to the space made. The mesh spread in this space without suturing. The peritoneum and posterior rectus sheath closed by absorbable suture, while the anterior rectus sheath closed by non-absorbable suture. Suction drains left in the sub- rectus plane and in the subcutaneous plane. These drains removed after 7-14 days, till drainage is less than 25 ml/day.

Patients followed closely in the first two weeks, then after one month, after that patient followed on his needs or by phone every six months. All patients postoperative stay nothing by mouth, board spectrum antibiotic (3rd generation cephalosporin1gm /12h.), adequate fluid, anticoagulant for group of patient with BMI more than 30 as 80unit per Kg single dose subcutaneous plus analgesia with encouragement for early mobilization. On day one post-operative day start sips of water and fluid diet according to condition of bowel activity. Patient discharged to home at 3rd post-operative day with course of oral antibiotic, after we change his dressing and educate him about drains care (cleaning and evacuated with note any increasing in output if happened. Drains were removed when drainage was less than 25 ml in 24 hours.

Result

Open ventral hernia repair for 67 patients from May 2014 to December 2016, we follow 67 patients who underwent open ventral hernia repair. We follow these patients for a period of two to thirty months. Most of these patients are age range 3050 years with male to female ration about 1/7.

Table 1: age distribution of patients

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Age	Male	Female
Below 30 years	1	7
30-50 years	5	36
Over 50 years	4	14
	10	57

The hernias are classified to umbilical, incisional, recurrent,(which includes both recurrent of all type of hernia), epigastric and combined (which mean both umbilical and epigastric hernia). We found the most common type is umbilical hernia 41.7% (n=28).

Table 2: type of hernias

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Type of hernia	Male	Female
Umbilical	3	25
Incisional	2	13
Recurrent #	2	6
Epigastric	1	12
Combined *	2	1

*combined means umbilical hernia and epigastric hernia #recurrent includes both recurrent incisional and umbilical hernia

The incisional hernias were distribution show that most of common incisional hernia is associated with Pfennestiel's incision.

Table 3: site of Incisional hernia

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Site of incision	Male	Female
Midline incision	2	1
Pfannestiel's	0	11
Loin incision	1	0

The recurrent hernia analysis show distribution to all incision and most of them were repaired previously by onlay mesh

Table 4: The recurrent hernia

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Type of recurrent hernia	1st recurrence	2nd recurrence	3rd recurrence	4th recurrence	5th recurrence
Umbilical hernia	2	1*	2*	1*	
Pfennestiel's	1				1*
Midline incision			1*		

On follow up of these patients we found the highest occurrence is seroma 7.5% (n=5), no recurrence no fistula no flap necrosis.

Table 5: the complication

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Complications	Male	Female	Age	Risk factors
Seroma		5		
SSI	1	1		
Intestinal obstruction				
Recurrence				
Flap necrosis				
Sinus formation				
Enterocutaneous fistula				

Discussion:

The repair of ventral hernia by sublay mesh repair is one of modality of repair, to secure the fixation of mesh in its place a sufficient overlap of mesh on all direction is important to reduce recurrence rate(10) Sabere, et al 2015, regard the drainage time, the mean total time in days was 7.47 days in onlay repair while in sublay group was 4.5 days. Seroma formation after suction drain removal was observed in 6% patients in onlay group and in 2% in sublay group. Purulent wound infection was observed in 8% and 4% patients in onlay group and sublay group respectively treated with dressing and proper antibiotics .(11) in our study we found the seroma is 7.5% (n=5). Eriksen et al 2009, found that laproscopic ventral hernia repair is associated with pain in post-operative period and also complain of fatigue during first 30days , so they need long period of time to regain activity while in open ventral hernia repair patient regain activity early with minimum pain.(12).while we did not found patient with severe pain and fatigue for long period of time.

Kruzer et al found that recurrence rate after sublay mesh repair were five (4%) recurrences. Altogether, 6 patients had abdominal wall discomfort, and 49 patients spontaneously wrote that they were pleased or very pleased with the long-term result.(13) in comparison with our study no recurrence occurs in our case during the follow up period.

Hameed et al 2009 found in sixty percent of patients (n=30), the most common incision leading to incisional hernia was the midline incision of abdomen followed by Pfannensteil's incision in fourteen percent (n=7) and paramedian incision in twelve (n=6). Major wound infection occurred in two patients (4%) only but without the removal of mesh. Forty patients (80%) attended for follow up ranging from 12 months to 24 months.

Twenty seven patients (67.5%) attended OPD for follow up and thirteen patients (32.5%) replied the questions on phone. No recurrence was noted in follow up group. Based on this study, he conclude that preperitoneal (sublay) mesh repair is the ideal technique for incisional hernia repair.(14) we found that patient operated upon for recurrent hernia most of them are Pfannensteil's incision. on comparing onlay versus sublay Murad, 2013 found The patients with seroma in onlay group were 12 percent, 34.67percent and 0 percent on 7th , 15th and 30th day respectively .Superficial surgical site (SSI) in the same group was 17.33 percent , 6.67 percent and 0 percent in 7th, 15th and 30th day respectively. The patients who presented with seroma in sublay group were 6.3percent, 3.78percent and 0 percent on 7th , 15th and 30th day respectively .SSI in the same sublay group were 4.3percent , 2.9 percent and 0 percent

on 7th, 15th and 30th day respectively.so he conclude Sublay is better than onlay technique with less postoperative complications, but operative time is slightly greater in sublay technique.(15) while in our study we found no recurrence no major complication as intestinal obstruction or fistulaization, but few patient with seroma and surgical site infection.

So we conclude that sublay mesh is one of best way of ventral hernia repair with minimum complications.

Conclusion

A -All patients submit to the following evaluations:

1. Complete blood picture,
2. Liver function tests,
3. Fasting and postprandial blood glucose,
4. Renal function test,
5. Radiograph of the abdomen, in erect and supine positions if there was obstruction,
6. Abdominal ultrasound, ECG.

B -All surgeries were conceded out under general anesthesia. Patients received a single dose of intravenous broad-spectrum antibiotic (at Induction or at time of skin incision) skin preparation was achieved with alcohol-based povidone-iodine.

C -All patients post-operative stay nothing by month, board spectrum antibiotic (3th generation cephalosporin1gm /12h.), adequate fluid, anticoagulant for group of patient with BMI>25 as 80unit per Kg single dose sub cut. And analgesia (pain killer) with engorgement for early mobilization. On day one post-operative day start sips of water and fluid diet according to condition of bowel sound .then patient discharging to home at day 2 pot op. with course of antibiotic with change dressing at day 3 and education hem who can deals with there's drains(cleaning and evacuated with note any increasing in output if happened. Drains were removed when drainage was less than 25 ml in 24 hours (about 10 -15 days).

D -We found no recurrence no major complication as intestinal obstruction or fistulaization, but few patients with seroma and surgical site infection.

So we conclude that sublay mesh is one of best way of ventral hernia repair with minimum complications.

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